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**From:** Jones, Joel E. [Jones.Joel@epa.gov]  
**Sent:** 6/11/2014 3:26:35 PM  
**To:** Rodriguez, Roberto [Rodriguez.Roberto@epa.gov]; Wampler, David [Wampler.David@epa.gov]  
**CC:** Pringle, Everett [Pringle.Everett@epa.gov]  
**Subject:** Fw: Notes from the March 3, 2010 Strategy Meeting for the Regional Arsenic Mitigation Project at Hopi  
**Attachments:** Sign-in Sheet - Arsenic Meeting - 3-3-10.pdf

Fyi

Sent from my BlackBerry 10 smartphone on the Verizon Wireless 4G LTE network.

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**From:** Bessie Lee <Lee.Bessie@epamail.epa.gov>  
**Sent:** Wednesday, June 11, 2014 8:24 AM  
**To:** Mike.Stover@mail.ihs.gov; marcus.felter@ihs.gov; peter.mitchell@ihs.gov; lpuhuyesva@hopi.nsn.us; GSHonanie@hopi.nsn.us; john.hamilton@ihs.gov; jason.crownholm@ihs.gov; genek@hopitelecom.net; chonyumptewa@hopi.nsn.us; rcharley@hopi.nsn.us; sheaton@commspeed.net; jpmason60@gmail.com; UMowa@hopi.nsn.us; brandon.beckman@ihs.gov; jpmason60@gmail.com; hehonanie@hopi.nsn.us  
**Cc:** Pringle, Everett; Jones, Joel E.  
**Subject:** Notes from the March 3, 2010 Strategy Meeting for the Regional Arsenic Mitigation Project at Hopi

A copy of the sign-in sheet for the March 3, 2010 meeting is attached. Bessie Lee was included by telephone.

Follow-up item are highlighted in blue.

**Background and Overview of the Regional Arsenic Mitigation Project** - Jason provided an overview of the Regional Arsenic Mitigation Project (Project). The concept was developed a couple of years ago. IHS has been working with WRP on the Project and has made several presentations (5 or so) to the First and Second Mesa villages. Arsenic mitigation is difficult for the First and Second Mesa water systems due to the unique chemistry of the water.

The first project pertaining to the arsenic issue in the First and Second Mesa areas was funded by USEPA in 2006 to explore an arsenic mitigation strategy for the area. IHS was tasked to assess issues, quantify the arsenic issue, and propose various health-based arsenic mitigation alternatives. IHS reviewed the water chemistry, identified complicating factors from a treatment perspective (e.g., type of arsenic, competing ions, water pH) and looked at various treatment methodologies (e.g., absorption, RO). The treatment train (i.e., different chemicals that need to be added) was long. Based on the information from the assessment, it was clear that treatment would be very difficult from a sustainability standpoint.

IHS found that arsenic is prevalent in the First and Second Mesa areas, with arsenic levels lower in the Second Mesa area (in the 11 to 15 ug/L range) than the First Mesa area (high 20's to low 30's ug/L level at Polacca and about 40 ug/L in the Keams Canyon area). In 2006, the arsenic MCL went from 50 ug/L to 10 ug/L. Prior to 2006, the Hopi water systems were in compliance with the arsenic standard.

IHS concluded that the best option for the First and Second Mesa areas is to seek water from another source. The infrastructure that is needed for centralized treatment has a high cost. These costs are about equal to the costs associated with a new water source and bringing this water to the villages. The Turquoise Trail area was identified as the potential new water source area. This area was recommended based on information from one well that was drilled a few years back. This one well is about 2,400 feet deep, with an open hole from 1,800 to 2,400 feet below ground surface. The static water level at this well is not deep, so the pump does not need to be set deep in the well. Information about this well indicated a significant quantify of water (driller of the Turquoise Trail well alluded that the well could produce over 1,000 gpm, but is unsupported because of the open hole formation) and arsenic levels that were below 3 ug/L. A pump test of the existing Turquoise Trail well indicated that pumping at 300 gpm resulted in 7 feet of drawdown. People need to keep in mind that if a well can be pumped over 1,000 gpm, it does not mean that it should be pumped at that rate. IHS indicated that the combined yield of the existing First and Second Mesa area drinking water source wells is about 400 gpm.

The Navajo Nation has data for a well at Hard Rock, which is adjacent to the Turquoise Trail area. The Hard Rock well had similar water quality and quantity (i.e., arsenic levels about 3 ug/L and high yielding). Gayl indicated that NTUA had some wells in the Hard Rock area that are not being used. (Gayl can show on a map where they are located.) These wells were drilled into the N-aquifer, but because of a fracture, some D-aquifer water was being mixed with the N-aquifer water. People used the water from the Hard Rock wells, but the people reportedly got sick. Jason or Bessie follow up with NTUA about the NTUA wells in the Hard Rock area.

Proper management of the Turquoise Trail area wells is needed because the Hopi Tribe will be sharing the N-aquifer with the Navajo Nation. A regional agreement will be needed.

There is an opportunity to develop multiple wells in the Turquoise Trail area, but this will not occur all at once. Constructing a second well now means redundancy. More wells can be installed later, when they are needed. The Project will provide water to those villages that have the high arsenic levels. Eventually, the Project could expand so that it could potentially provide water to the First, Second, and Third Mesa villages with one central system. With the Project, none of the existing village water systems will need to be modified. The Project will provide water to the existing storage tanks of the individual village water systems.

The drinking water source wells in the First and Second Mesa areas are low producing, so they do not help from a growth aspect. Both IHS and USEPA do not fund projects for economic growth, but the agencies understand that drinking water projects could assist with economic development.

The Hopi Tribal Council has a Water Team and a Land Team. Presently, the Water Team is working on a Colorado River litigation, which does not result in money that could be awarded to the Tribe. With a settlement, there is money involved. The Water Team has been discussing a regional water system for Hopi with Lake Powell providing the source water.

**Enforcement** - USEPA has a new Enforcement Response Policy (ERP) which states that a public water system with an ERP health-based score of 11 or above has 6 months for the water system to be returned to compliance or be under a formal enforcement action, such as an Administrative Order. The Administrative Order includes a work plan and down the road, potential associated penalties if the terms of the Order are not met. Bessie estimated that probably by the end of 2011, all the Hopi water systems with an arsenic issue would be under a formal enforcement action with USEPA. The Order will be directed to the Tribe, the Village, or both.

The question was asked how a work plan schedule can be included in an Order if the funding for the mitigation plan is unknown. Bessie indicated that this issue is not unique to tribal water systems and USEPA is presently discussing internally how to address the funding and its effect on the return to compliance of a water system.

**Project Funding** - IHS estimates that the entire Project would cost about \$20 to \$25 million. This cost estimate would be revised as the Project moves toward a more substantive design. IHS, USEPA, and HUD are candidates for providing funding for the Project. USDA-Rural Development is also a potential funding source. Over the last couple of years, IHS has sought resolutions for the Project from the affected Villages. IHS has not been successful in getting the resolutions. The Project should be driven by the Tribe and Villages, who should be advocating for the Project to the potential funding agencies. To make the Project a reality, we need to continue substantiating the concept, looking at the viability of the Project, looking at the costs, and participating at all levels as needed. Realistically, no funding would be available from a federal agency until an O&M plan is in place, the Project can be implemented, and the Project is sustainable. In order to get the funding, substantive documents (i.e., agreements, ordinances) will be needed. IHS can continue on the engineering aspect of the Project. However, the day-to-day operations need to be addressed by the Tribe, with the federal agencies providing the support.

IHS has some funding for some of the planning activities for the Project. The IHS funding will cover the EA and archaeological activities. USEPA recently funded part of the first phase of the Project with Drinking Water Tribal Set-Aside money. The funded activities include the drilling of a new well in the Turquoise Trail area, bringing electrical power to the area, refurbishing the existing well, conducting a hydrogeological analysis concurrent with the well drilling activities, and preparing a regional asset management plan (to advance a business plan or asset management plan, and an O&M plan).

The Tribe should consider a longer-term plan that would also include the Third Mesa area. However, federal funding for the Third Mesa area would not be health-based driven since the arsenic levels of the Third Mesa water systems are below the MCL.

Jason indicated that the highest Project cost is not the new well. Rather, it is the piping. This means that the Tribe needs

to develop codes that apply to all the Hopi villages. The development of the O&M plan could include development of ordinances (e.g., minimum pipe diameter size, shut off process), as well as development of a comprehensive utility program.

IHS could be working on the Project later this year. Jason will be transferring to another location around the June 2010 time period. Brandon Beckman will be taking over a lot of the Hopi issues that Jason has been working on.

**Next Steps** - Lionel will develop a list of "next step" activities and associated timeline for each activity. The list will include:

- Meet with the CSAs to discuss the Project. At the next call/meeting, Lionel will present what is needed. Gene indicated the next meeting of the all the CSAs is scheduled for the week of March 15, 2010.
- Present the Project to the Hopi Tribal Council.
- Present the Project to the Village Board of Directors. The Villages do not want to give up their water systems. It was suggested that the Tribe install a meter to each Village and have each Village pay the Tribe for water that is used from the Project.
- Jason and Lionel will develop an article/fact sheet about the project, which will be handed out to the Villages, agencies, and tribal staff.
- Put together a team to look at the management strategy for shared resources. Village buy-in can be included in the strategy. The project should be a locally-driven process.
- Add 15 to 30 minutes to the monthly Hopi calls about the drinking water projects to discuss the status of Project.

**Next Call/Meeting** - It is planned to have a face-to-face meeting about the status of Project activities on Wednesday, April 14, 2010, rather than have a call on Wednesday, April 7, 2010. Bessie will check if Everett Pringle of the USEPA Drinking Water Office's enforcement group is available for the April 14, 2010 meeting to discuss enforcement orders and what is included in an order (e.g., how to include a timeline if not sure of funding).

If you have any comments, additions or deletions to the above notes, please let me know ASAP.

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Bessie Lee  
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